July 18, 2005

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of:	)	
Digital Audio Broadcasting Systems And Their Impact on the Terrestrial Radio Broadcast Service	)	MM Docket No. 99-325

COMMENTS OF IMPUSE RADIO ON
NATIONAL RADIO SYSTEMS COMMITTEE'S
"IN-BAND/ON-CHANNEL DIGITAL RADIO BROADCASTING STANDARD NRSC-5"

Impulse Radio submits these comments, in response to the *Public Notice* of June 16, 2005, to identify deficiencies in the proposed National Radio Systems Committee (the "NRSC") *In Band/On-Channel Digital Radio Broadcasting Standard NRSC-5* ("NRSC-5") and to urge the Federal Communications Commission (the "Commission") to require completion of the standard prior to adopting it for digital audio broadcasting ("DAB"). Specifically, we recommend that the Commission reject the proposed standard and remand the specification back to the NRSC for completion. Completing the standard would require either the inclusion of a fully disclosed codec specification or the full disclosure of a codec "registration and signaling mechanism" that will allow the standard to function on a "codec-agnostic basis". Completion would also require including in the adopted standard an open specification for data service transmission that supports the myriad of stakeholders in data service technology. It is our

belief that the current standard adopts what amounts to an undisclosed system that will have only one implementer (iBiquity Digital) for not just the core digital audio technology already developed by said implementer, but for any further innovations made in the audio or data aspects of the system going forward. We further do not believe that it serves the public interest to allow such a "monopoly" to be created for AM/FM Radio. We offer the following support and rationale for these conclusions.

I. THE STANDARD IS NOT COMPLETE

As pointed out by Jonathan Hardis of the National Institute for Standards and Technology ("NIST") is his Memorandum For Digital Audio Broadcasting Subcommittee of the NRSC, dated March 1, 2005 (the "Hardis Memorandum"), the proposed draft standard is not a "complete technical specification of a digital audio broadcasting (DAB) system". We agree with the Hardis Memorandum and one of iBiquity Digital Corporation's predecessor companies, USA Digital Radio, in stating in one if its earlier applications to the FCC that "an IBOC DAB standard is required in order to ensure universal compatibility among digital transmitters and receivers" and that first, "the standard must include an audio compression or source coding (the "codec") standard".

The lack of disclosure of a codec in the standard, by itself, makes the standard de facto incomplete.

Finally, the failure to disclose and define a transport for ancillary data in the draft standard omits from the standard what we believe to be a critical component in

encouraging the rapid adoption of DAB radio by broadcaster, receiver and equipment manufacturers and, in particular, consumers.

In addition, the failure by iBiquity to bring forth its proposal for the data transport in time for the IBOC Standards Development Working Group (the "ISDWG") of the NRSC (the ad hoc body created by the Digital Audio Broadcast Subcommittee (the "DAB Subcommittee") of the NRSC to assess and standardize the IBOC technology) to have a sufficient opportunity to review and vote upon points to our further concern that iBiquity has dominated and manipulated the standards process to its own competitive and commercial advantage.

iBiquity brought forth its Advanced Application Service ("AAS") proposal to the ISDWG very late in the process. Well after, in fact, AAS had been implemented in systems being built by its preferred licensing partners and well after many within the group had called for its disclosure to be made. When questions arose as to its approach and the adequacy of AAS, iBiquity stated that they would not agree to change it because working systems were already being manufactured.

Absent a change in the manner that this standard is completed in the future, the placeholder language currently in the draft standard will allow iBiquity to continue to manipulate the process to its advantage and away from the stated goals of the NRSC and the DAB Subcommittee. This will be discussed in greater detail in the next section.

II. **THE STANDARD IS ANTI-COMPETITIVE**

Beyond leading to an incomplete standard, the process has led to an anti-competitive standard. The Consumer Electronics Association (the "CEA") legal guidelines for standardization state that a standardization program "shall not be proposed for or indirectly result in . . . restricting competition, giving a competitive advantage to any manufacturer, excluding competitors from the market, limiting or otherwise curtailing production, or reducing product variations."[1] Furthermore, according to CEA legal counsel, John Kelly, in his "NRSC Patent Policy and Anti-Trust Training Session" a standardization process can "result in anti-trust concerns when that process favors some competitors without technical justification."[2]

It is the opinion of Impulse Radio that the standard setting process that has resulted in NRSC-5 has done just that.

The selection of the current audio codec and its lack of disclosure have been made to accommodate the commercial needs of iBiquity. iBiquity's PAC codec, which was also not disclosed, was dropped during the standard setting process as a result of technical deficiency. iBiquity was given more than half a year to find and test a replacement. This was done despite the fact that an available and open codec already existed and this codec had already been tested by the NRSC[3]. It would have certainly been within the NRSC's domain as a standard setting organization to choose this original codec or to call for other technology holders to bring codec solutions forward. Instead iBiquity was permitted to bring forward another proprietary codec solution (the HDC

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[1] http://www.ce.org/standards/pdf/legal_guides.pdf

[2] http://www.nsrcstandars.org/nrsc/NRSCFiles/NRSC%20Full%20committee/NRSC%20archive/NRSC%20antitrust_3.10.05.pdf

[3] MPEG-2 AAC

codec) and this codec has been allowed to remain undisclosed resulting in the incomplete and de-facto nature of the current standard.

The new proprietary codec, and its role in the standard, are the result of an agreement reached between iBiquity and the NRSC that allows iBiquity to exclude the codec from the standard setting in return for the missing scrambler sequence and the data transport definition.

However, iBiquity failed to bring forward the data transport definition (AAS) in time to meet the standard development timeline. This additional time gives iBiquity an unfair advantage over competitors in our estimation.

Impulse Radio has proposed an alternative technical solution for the data transport. We first attempted to bring this solution forward in November of 2002, based upon our belief that a data transport is a vital part of the system being standardized and that iBiquity had no intention of bringing one forward.[4] This was later confirmed by iBiquity in a letter to the committee in September of 2004 in response to the disclosure concerns of the group.[5] It was not until July of 2004 that Impulse Radio's proposal was given attention by the group, but even then our company was forced to wait until November of 2004 when iBiquity would bring their documentation for AAS to the group. All the while, as noted by Al Shuldiner, they worked to entrench their solution in the marketplace.

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[4]The importance of a data transport is underscored in the goals and objectives established by the DAB sub-committee for the standard setting. These goals and objectives are available in the ISDWG minutes at http://www.nrscstandards.org/nrsc/NRSCFiles/Minutes/ISDWG%20Minutes/2002/M_021021ISDWG.pdf, appendix A

[5]http://www.nrscstandards.org/nrsc/NRSCFiles/ISDWG/ISDWG%20archive/iBiquity%20letter%20030915%20disclosure%20requirements.pdf

Given iBiquity's position and the proprietary nature of key aspects of the system (namely the audio codec and at this point the scrambler sequence) iBiquity has been afforded the opportunity to commercialize their data transport system before competitors such as Impulse Radio have a chance to market their own. This is clearly their intent as stated by Al Shuldiner in the April 8, 2004 ISDWG meeting, ". . . It was noted that some receivers with AAS capability are likely to be produced well before iBiquity presents the specifications for AAS to the NRSC. This is because iBiquity is delivering the software for AAS to its clients before the documentation for AAS has been completed."[6]

The current process has clearly afforded the iBiquity AAS solution the upper hand in the standard when the ISDWG reconvenes to turn the data transport placeholder into a bon-a-fide specification. Any other solution would have to fight an uphill battle against a commercialized system that is operating as a de-facto standard.

This is harmful to competition and limiting in product variation, as we believe the AAS system will be insufficient to support a wide array of data services as well as being inefficient in its use of the bandwidth available for data transport.

As is evidenced in the minutes of the ISDWG proceeding[7], particularly in regards to the data transport, iBiquity has shown reluctance to modify their solution to meet any requirements the ISDWG attempts to impose upon the system, despite the fact that requirements setting is a reasonable activity for any Standards Development Organization ("SDO") to undertake. So it would be doubtful that the ISDWG would be

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[6] http://www.nrscstandards.org/nrsc/NRSCFiles/Minutes/ISDWG%20Minutes/2002/M_040408ISDWG.pdf

[7] http://www.nrscstandards.org/nrsc/Minutes.asp

successful in getting iBiquity to improve upon its solution to overcome the deficiency. A deficiency that according to iBiquity is based upon the design limitations of their receiver platform, a platform chosen to meet their own commercial interests[8].

It is the opinion of Impulse Radio that this activity has resulted in the clear favoring of a particular solution without technical justification.

III. **THE STANDARD IS NOT ENFORCEABLE**

Standard setting does not take place in a vacuum and the work of the ISDWG is no exception. It is well known by all participants that while we are engaged in a process of standardizing part of a larger digital radio system, that system is in the process of being implemented in the marketplace. Indeed, many of the participants involved in this commercial implementation are part of this standard setting process

A problem arises in that the standard is not considering the entire system as described above[9]. Interoperability in real-life implementations will demand that the transmission system and the receiver system have a standardized codec. Therefore, any implementers of the standard must look to the market for the audio codec to ensure interoperability. To have any hope that the market will accept their IBOC implementation they must include an HDC codec as part of it. Otherwise, their equipment will not operate with the existing installed base, rendering it useless to the

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[8] http://www.nrscstandards.org/nrsc/NRSCFiles/ISDWG/ISDWG%20archive/ISDWG_Comment_Tracking_Master_02_08_05.pdf, question 331 regarding document 1019s

[9] The standard even fails to address at least 2 aspects of the FCC evaluation criteria, namely audio fidelity and auxiliary capability in its current form (see http://www.fcc.gov/fcc-bin/audio/FCC-02-286A1.pdf section 5).

market. This is equally true of the data transport, which the standard has failed to address to this point, but which iBiquity is free to implement commercially.

The practical result of this is that we are creating two standards, a consensus standard, and a de-facto standard. The consensus standard is a sub-set of the de-facto standard. The consensus standard is controlled by the SDO. The de-facto standard is controlled by a single company and subject to change without notice. All this means that as an implementer, one must look to the de-facto standard as the governing standard, rendering the consensus standard and the SDO impotent.

Furthermore, control over the standard documents is unclear. One would expect in an open standard setting process the control over the documents to reside with the SDO. However, the HD Radio standard is mostly defined by a series of iBiquity reference documents. NRSC-5 is a relatively short document in comparison to the large volume of information contained within the reference documents. These reference documents are controlled by iBiquity.

By contrast one should consider similar standards. A review of the ATSC standard documents show that all normative references of the standard are documents that are controlled by the ATSC or some other standard development organization.[10] The same can be said of the DRM and the Eureka 147 digital radio standards[11].

A standard is an agreement made between competitors, customers, and the general public to grant a permanent monopoly to one or more technology holders. The SDO is the keeper of the agreement and should thusly own and control the documents. This must be clarified.

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[10] http://www.atsc.org/standards.

IV. **THE STANDARD PROCESS WAS NOT FREE FROM DOMINANCE**

As stated in Essential Requirements: Due process requirements for American National Standards, issued by the American National Standards Institute ("ANSI")[12], under whose rules the NRSC standards settings activities operate:

"The standards development process shall not be dominated by any single interest category, individual or organization. Dominance means a position or exercise of dominant authority, leadership, or influence by reason of superior leverage, strength, or representation to the exclusion of fair and equitable consideration of other viewpoints."

We believe that it is without question that iBiquity has wielded an undue amount of dominance over this standard setting process. It has been the sole proponent of technology; it has, by action and inaction, influenced the time line for consideration of the various parts of the standard, and has used its leverage as the dominant voice in the proceedings to gain unfair competitive and commercial advantage. Further, when presented with one specific proposal for technology other than its own (the Impulse Radio protocol for data transport), Al Shuldiner on behalf of iBiquity stated that while the ISDWG was free to adopt the Impulse Radio protocol or any other transport protocol it wished to, if the group did not adopt iBiquity's AAS proposal, iBiquity would withdraw its participation in the standard setting process.

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[11] http://webapp.etsi.org/IPR/home.asp and http://www.worlddab.org respectively.
[12] http://public.ansi.org/ansionline/Documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/

As noted above, in delaying the submission of its AAS proposal until long after it had been shared with iBiquity's commercial partners and after commercial implementations had [according to iBiquity] already been commenced, iBiquity used its dominant position in the standards process to its unfair commercial advantage, and is trying to use its position to limit the choices available to the NRSC.

The NRSC agreed in January 2003 to establish a subcommittee, the Digital Data Broadcasting subcommittee, an action that was opposed by iBiquity. By refusing to participate in any discussion or permit the commencement of activity of the DDB, iBiquity was able to use its dominant position to suspend the DDB before it commenced. Had the DDB moved forward in pursuit of its goals and objective, we would likely now have, at a minimum, a consensus on a truly open and industry-supported transport protocol.

V. THE STANDARD DOES NOT MEET THE GOALS AND OBJECTIVES ESTABLISHED BY THE DAB

Again as pointed out in the Hardis Memorandum, the proposed draft standard is in conflict with the goals and objectives established by the DAB for the ISDWG.

The objectives of the DAB are to "develop formal NRSC standards that will furnish broadcasters and manufacturers of both broadcast and receiver equipment with a complete and open transmission and reception specification" and to "provide the FCC with an industry developed and supported standard that will aid in establishing final

rules for the implementation of IBOC technology in a manner that will best serve the public interest."[13]

As stated above, and in the Hardis Memorandum, the absence of a specified and disclosed codec, the lack of details relating to the scrambler sequence, and the lack of an open and disclosed data transport system each, on their own, make the standard incomplete, and therefore in conflict with the stated goals of the DAB Subcommittee.

Further, the public interest is plainly not served by a standard that does not ensure the compatibility between transmission and reception.

[13] http://www.nrscstandards.org/nrsc/NRSCFiles/Minutes/ISDWG%20Minutes/2002/M_021021ISDWG.pdf, appendix A

VI. CONCLUSION

Ultimately, these problems could have been avoided. We believe we have been on record proposing solutions for various deficiencies in the specification since the process began, as have more than a few others. We urge the Commission not to allow for final rule-making based upon NRSC-5. Allowing a flawed standard to be set in the rules may seem convenient in the short run, but in time it will undermine the technology, and most importantly the public interest.

Respectfully submitted,

IMPUSE RADIO

By: _____

Paul Signorelli

CTO

IMPULSE RADIO

1890 Palmer Avenue

Suite 203

Larchmont, NY 10538

(917) 577-0965